Instructions & Tips for updating the firmware on HW-USBN-2B

The Lattice HW-USBN-2B includes a few programmable devices which facilitate its operation. These include the following:

- Lattice MachXO2 FPGA: LCMXO2-1200HC-4MG132I
- Lattice Power Manager II: ispPAC-POWR607-01SN32I
- FTDI uC: FT2232HL & associated EPROM

The firmware on each of these devices can be updated using Diamond Programmer for the Lattice devices, and FTDI's FT_Prog for the FTDI uC.

Updating the Lattice firmware

Downloading & installing Diamond Programmer

First, you'll need to use Diamond Programmer v3.4 or later. This can be downloaded as a free installation from the following location:

http://www.latticesemi.com/software

Scroll down to the "Programmer and Deployment Tool", click on it, find the version that matches your operating system. Then, follow the download & installation instructions.
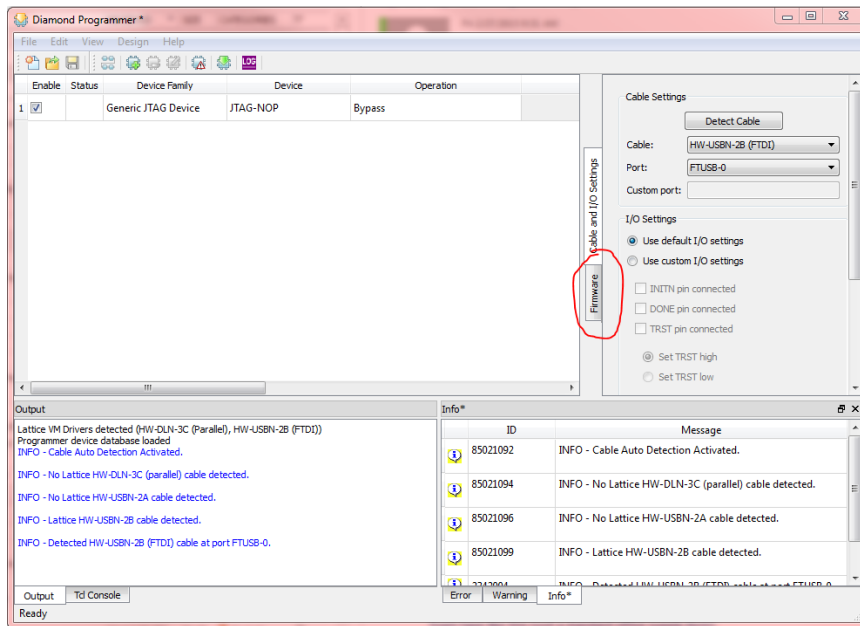
Updating the Firmware

When you launch Diamond Programmer, a dialog will ask you if you want to create a new project from scan, create a new blank project or open an existing project. Choose whichever you like.

Be sure the HW-USBN-2B is connected to a live USB port on your system.

Next, you might have to click the "Detect Cable" button on the right side of the screen, or select "HW-USBN-2B (FTDI)" from the drop-down box.
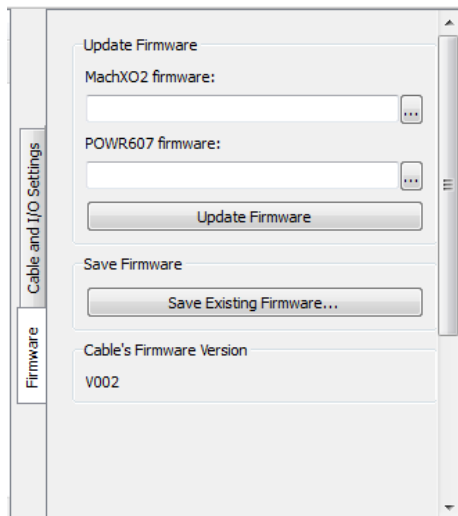
> If the HW-USBN-2B is not recognized, there may be an issue with the FTDI firmware. If this is the case, see the "Updating the FTDI FT2232HL Firmware" section of this document below, then return here. If this still doesn't work, check the Troubleshooting section at the end of this document for an alternate method.

There should be a "Firmware" tab visible in the upper-right box, as seen (circled) here:

If you do not see the Firmware tab, try this: Select the Design → Scan button. Even if there is nothing for the cable to scan, it will ping the software to add the Firmware tab.

Click the Firmware tab, and you'll see the following options:

Note: If you wish to save the existing firmware, the option is provided as indicated in the Firmware tab. Before you update the HW-USBN-2B firmware, it might be prudent to save the existing firmware first.

If you're reading this document, you've likely already downloaded the appropriate files along with this document. These will include files such as "XO2Firmware.jed" and "POWR607Firmware.jed".

If you don't have these files, navigate to:

http://www.latticesemi.com/cables

and look for the Firmware download at the bottom of the screen.

Click the little "…" buttons and select the files as appropriate.

Click the "Update Firmware" button.

This should complete the Firmware update process.

Updating the FTDI FT2232HL Firmware

The main purpose of the FT2232HL firmware is to make sure the HW-USBN-2B is properly recognized by your system. The FTDI FT2232HL firmware is programmable via a different software program produced by FTDI.

> Note: The FT2232HL USB uC includes two USB channels/ports. Channel/Port 0 is used to facilitate normal JTAG programming with the HW-USBN-2B. Channel/Port 1 is used to program the firmware of the Lattice devices as described above.

Downloading & Installing FT_Prog

As of this writing, FT_Prog is available for download from the following link:

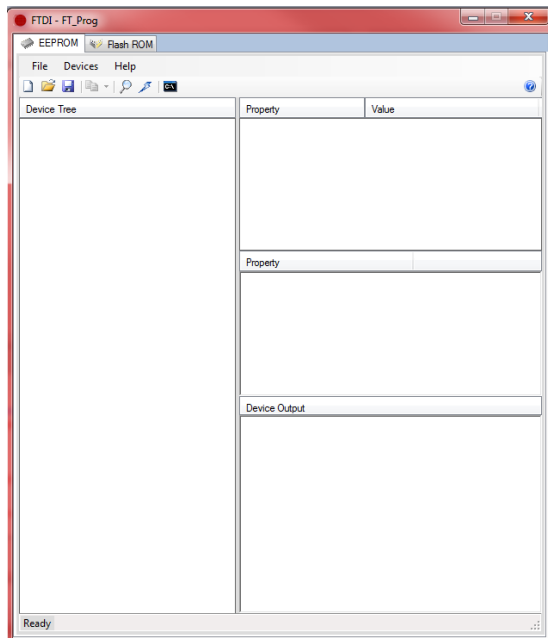http://www.ftdichip.com/Support/Utilities.htm

It's possible this url may change. If you can't find it, try searching (google) for "FTDI FT_Prog".

Scroll down on this page (FTDI produces many software utilities) to find FT_PROG. Note all the various warnings and advice (e.g. the User Guide, and the requirement for Microsoft .NET Framework 4.0).
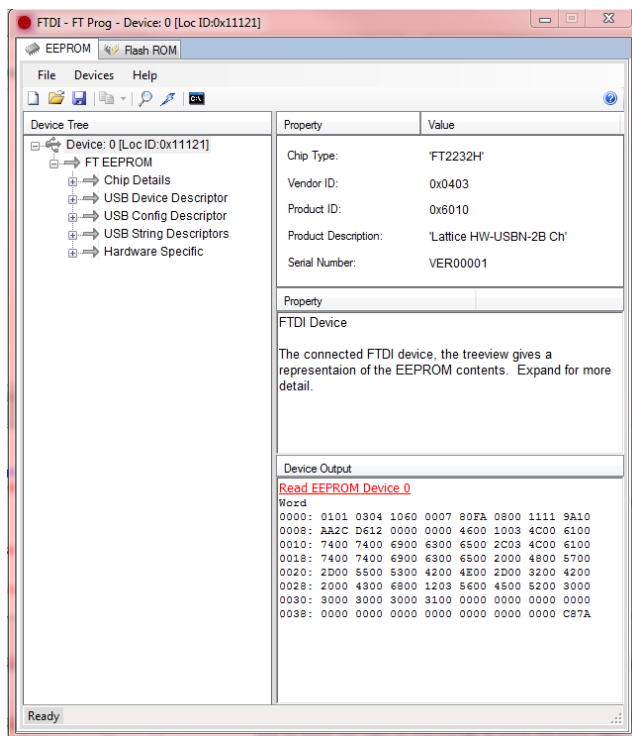
Using FT_Prog & Updating the firmware

First, be sure the HW-USBN-2B is connected to an active USB port on your system.

After you install & launch FT_Prog, you'll see a blank main screen like this:

First thing to do is scan. Click the magnifying glass icon: , the screen should then look something like this:
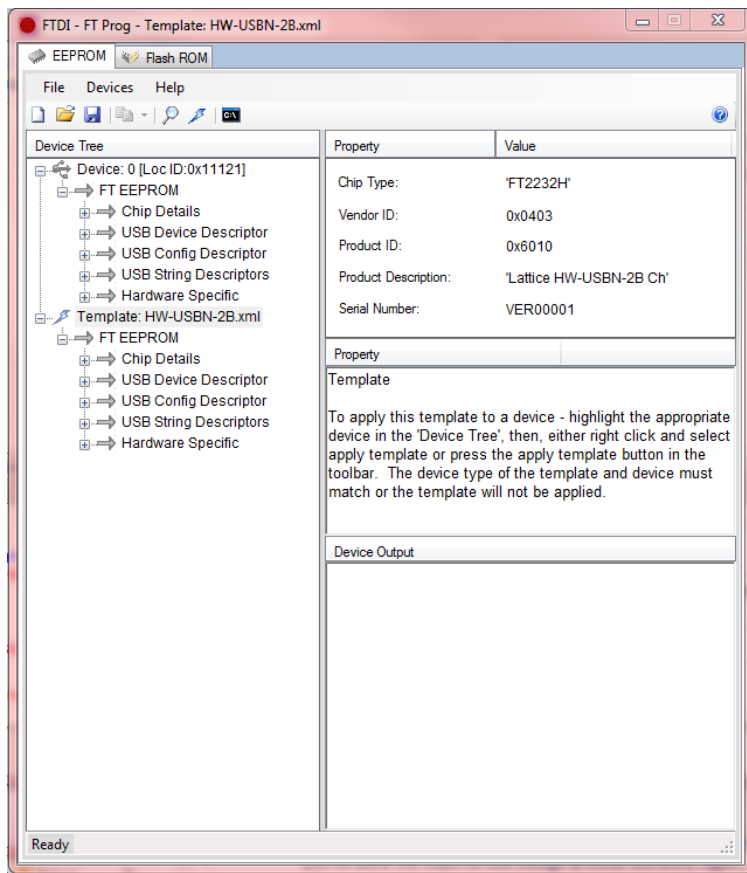

Note that in this example, the "Product Description" reads: "Lattice HW-USBN-2B Ch". This indicates that the firmware is correct. Diamond Programmer reads this "Product Description" to recognize the HW-USBN-2B.

If this "Product Description" is not correct, you'll need to update the firmware.

Select File → Open Template, and navigate to the file "HW-USBN-2B.xml", which is included for download on the Lattice website (along with the Lattice firmware described above in this document).
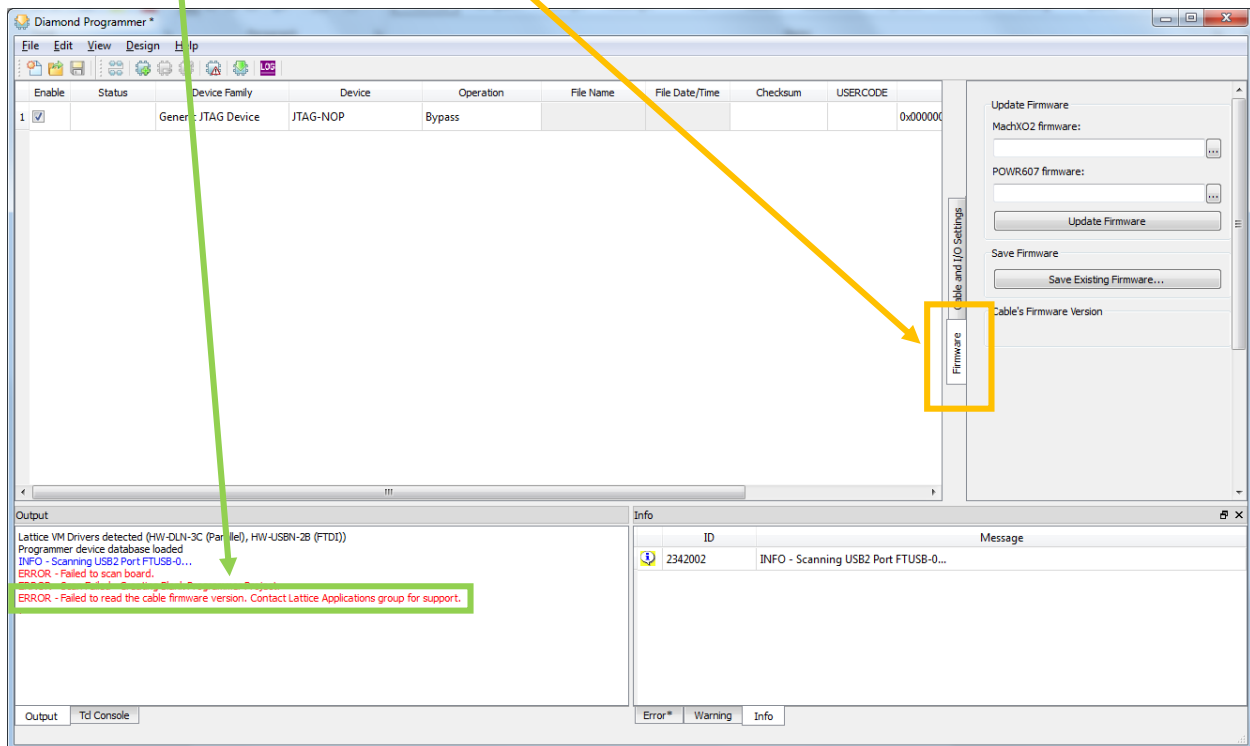
Your FT_Prog screen should now look like this:

With the "Template: HW-USBN-2B.xml" selected, click the lightning bolt icon from the toolbar:

This will open a dialog box. Click "Program" to update the firmware for the FT2232HL device (programming time is very quick).

Troubleshooting

Workaround to Update HW-USBN-2B's firmware when it fails to read

Issue: When choosing the Firmware tab to Read and Update Firmware in Diamond Programmer, the version cannot be read:
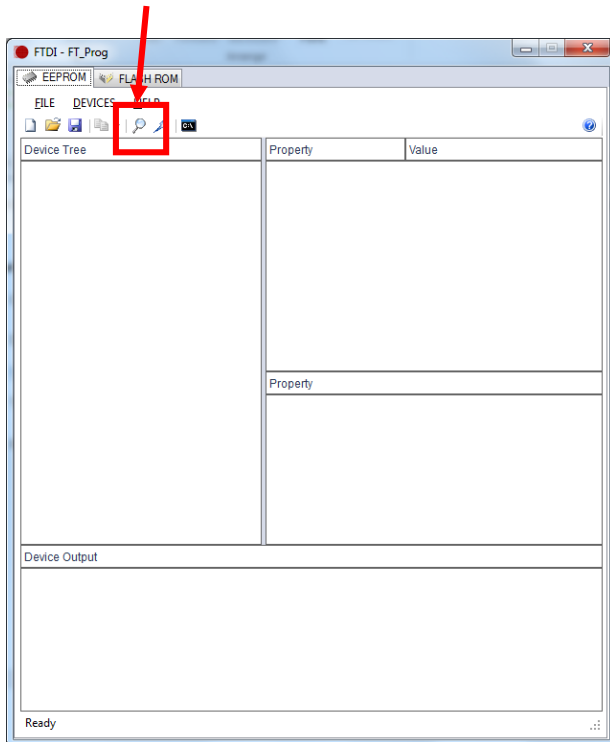

This is probably an issue with the OS's Cable driver that has been detected in some versions of Windows. Follow the below steps to perform a workaround and resolve this issue.
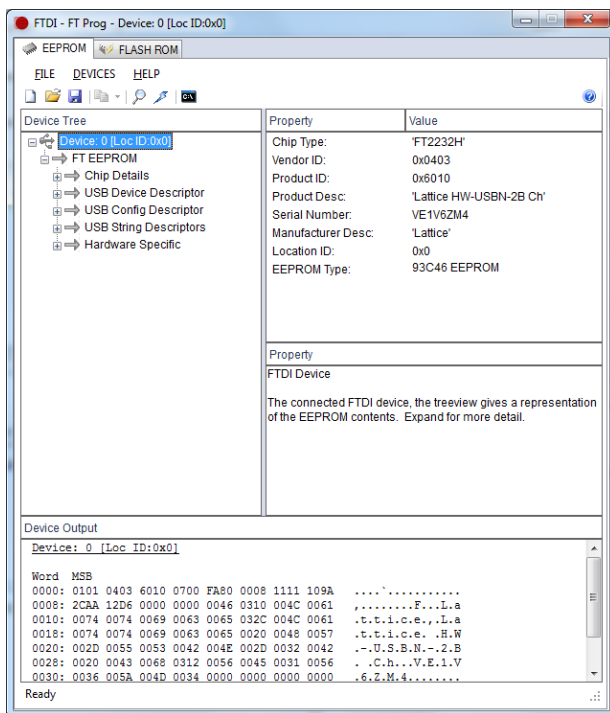
1) Close Diamond Programmer

2) Download and install FT_Prog from FTDI's page:

    http://www.ftdichip.com/Support/Utilities.htm#FT_PROG

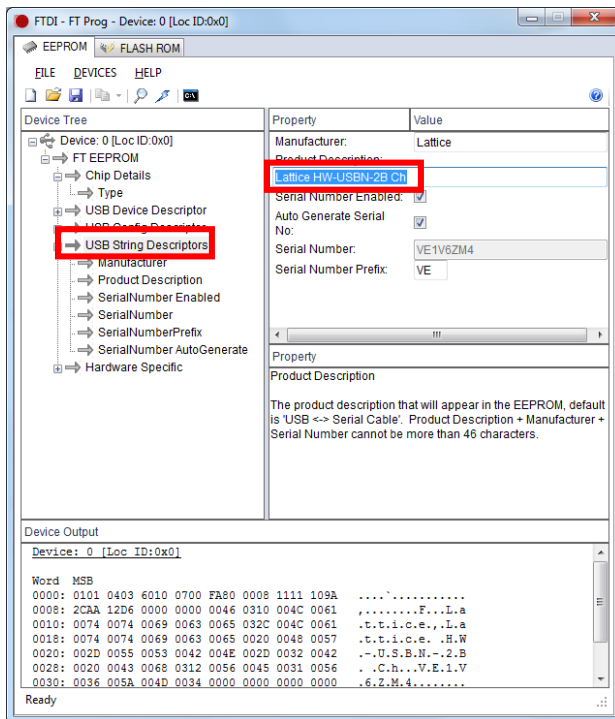   The version used for this document was v3.6.88.402, the latest as of 09/25/2017

3) Run FT_PROG and select Scan and Parse (by choosing DEVICES → Scan and Parse or by pressing on the magnifying glass icon:
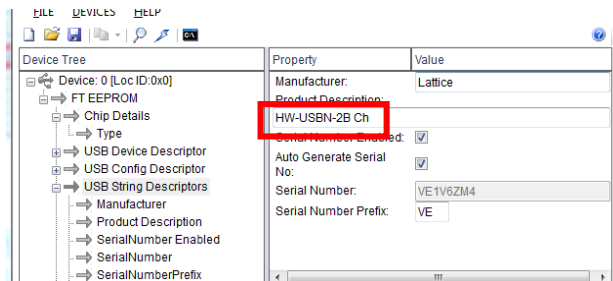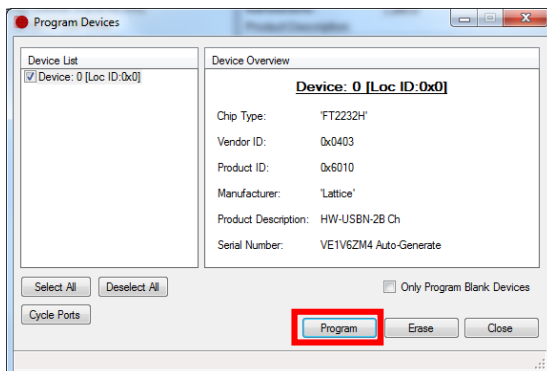

4) The screen should display information, as below:

5) In the Device Tree pane on the left, select "USB String Descriptors"

6) The Product Description property on the right pane should read "Lattice HW-USBN-2B Ch":

7) Delete the string *"Lattice"* from the Product Description Value:

8) Click on the Lightning icon or choose DEVICES → Program and click on Program on the next screen:
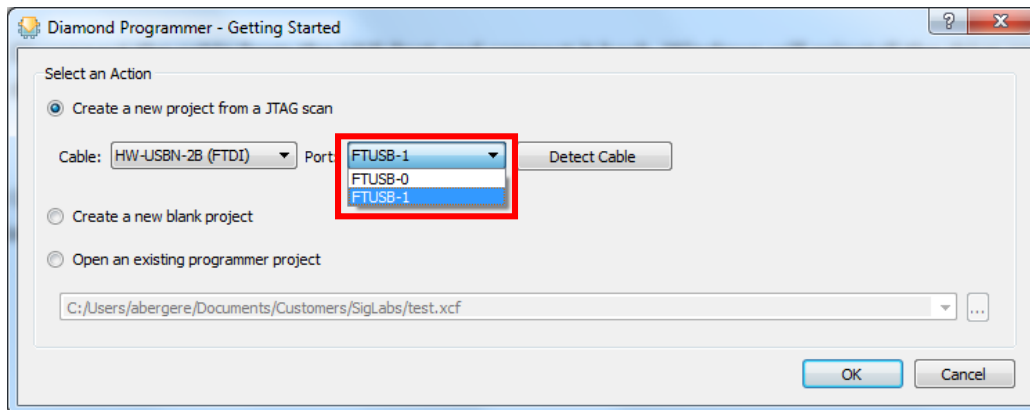
9) The Programming time is very short (under 2 seconds)

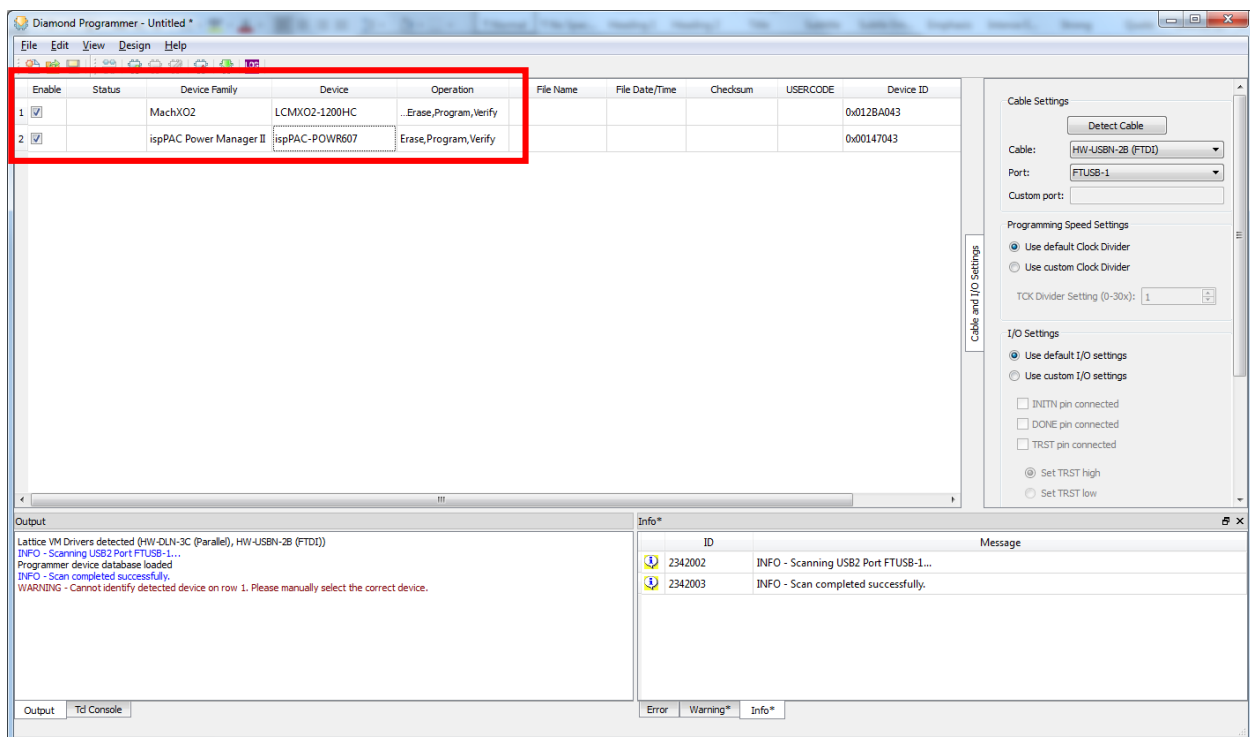10) Disconnect the cable from the USB Port and connect it back.

11) Windows will reinstall the drive and display "Installing device driver software" and "Your device is ready to use"

12) Open Diamond Programmer and select Port FTUSB-1 of the cable's FTDI chip (use Combo Box):
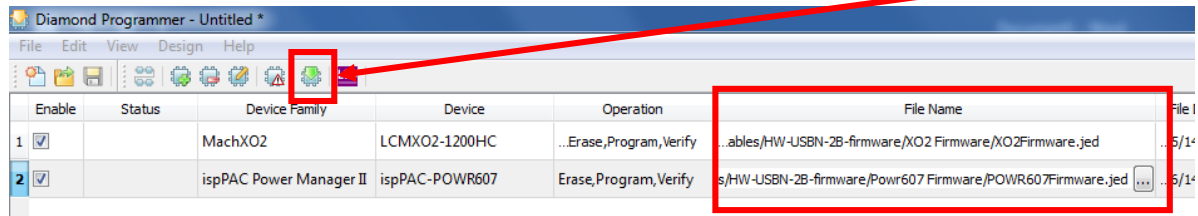

13) The JTAG Chain will identify both Lattice devices present inside the HW-USBN-2B programmer cable:
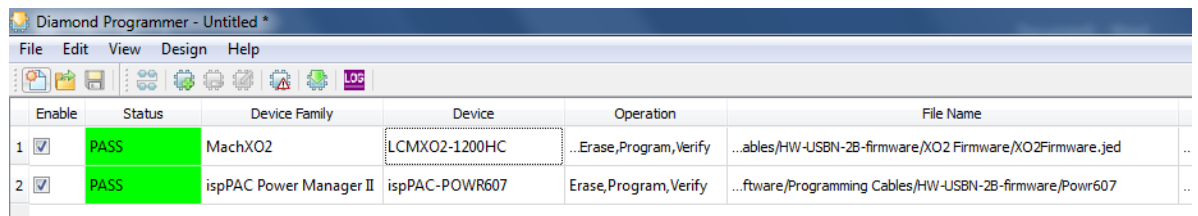   - LCMXO2-1200HC
   - ispPAC-POWR607

14) Select the appropriate .jed as explained in the Cable Firmware Update Instructions and Program:

15) The Status of both devices should be PASS after Programming:

16) Follow steps 3 through 11 to revert the USB String Descriptor to "Lattice HW-USBN-2B Ch", thus recovering original functionality (only FTUSB-0 port available from the Cable's FTDI chip)